

In The Drawings:

Please substitute the one sheet of drawings submitted herewith containing Figure 1 in place of the originally filed drawing sheet containing the same figure. Also, please add one sheet of drawings submitted herewith containing new Figures 1A, 1B, and 1C.

REMARKS**Introductory Comments:**

Claims 1-34 are pending in the application. Claims 1-20 and 33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1-6, 15, 21, 23-27, and 29 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent 6474753 to Rieth et al. Claims 7-9, 22, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rieth et al. in view of US Patent 6411204 to Bloomfield et al. Claims 10, 16, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rieth et al. in view of US Patent 4969103 to Maekawa. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rieth et al. in view of US Patent 6543567 to Deluca et al. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rieth et al. in view of US Patent 6488109 to Igaki et al. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rieth et al. in view of US Patent 4050746 to Durling. Claims 18 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rieth et al. in view of Maekawa and further in view of US Patent 6488109 to Igaki et al. Claims 20 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rieth et al. in view of Maekawa and further in view of Durling. Claims 1 and 23 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 13 of U.S. Patent No. 6677855 in view of Rieth et al. Claims 12, 16, and 30 are cancelled, and Applicants respectfully request reconsideration of claims 1-11, 13-15, 17, 29, and 31-34.

In Response To The Drawing Objections:

Regarding the drawing objections discussed in paragraph 1 of the Office Action, Applicants have amended the drawings in accordance with the Examiner's suggestions. Further, Applicants have added Figures 1A, 1B, and 1C to illustrate further the components discussed in paragraph 1 in accordance with the description provided in paragraphs [0037] and [0045]. No new matter has been added. Applicants therefore submit one Replacement Sheet containing Figure 1 and one New Sheet of drawings containing Figures 1, 1A, 1B, and 1C.

Regarding the drawing objections discussed in paragraph 2 of the Office Action, as discussed above, the Applicants have added Figures 1A, 1B, and 1C, thereby illustrating the first, second, and third states of the friction component as in claims 1 and 10. Applicants have also added reference to the new Figures in paragraphs [0013] and [0028]. Applicants believe that the matter illustrated in Figures 1A, 1B, and 1C was thoroughly explained in the Detailed Description and the Claims such that one skilled in the art would be enabled thereby. However, Applicants have added the Figures in order to clarify the already present and adequate explanation.

Regarding the drawing objections discussed in paragraph 3 of the Office Action, the Applicants have amended the drawings in accordance with the Examiner's suggestions.

Applicants believe that the drawing objections are overcome in view of the aforementioned amendments to the drawings and the Detailed Description of the Preferred Embodiment.

In Response To The Specification Objections:

The Specification is objected to for various informalities. The Applicants respond to the aforementioned objections by amending the Detailed Description of the Preferred Embodiment in accordance with the Examiner's suggestions with the following exception: rather than change all references to "cylinder 74" and "controller 46", Applicants have instead amended Figure 1 such that the specification items (cylinder and controller) are now properly identified in the drawings.

In Response To The 35 U.S.C. 112, Second Paragraph Claim Rejections:

Claims 1-20 and 33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

More specifically, claims 1, 6, 15, and 21 are rejected for lacking proper antecedent basis. In response, claims 1, 6, 15, and 21 have been amended to remove the antecedent basis problem.

Claims 13, 19, and 33 are rejected for including the phrase "a limit of handling point", which the Examiner found indefinite. In response to this rejection, the Applicants amend paragraph [0030] to clarify the term "a limit of handling point" in accordance with Applicants' original intent including, "in other words a point at which the vehicle cannot be safely handled by a driver due to, for example, vehicle speed." Applicants now believe sufficient clarification for the term is provided. No new matter has been added.

Claim 14 is rejected because the Examiner found the phrase "a proximity sensor" in the last two lines of the claim to be indefinite. In response to this rejection, Applicants amend the claim to include proper antecedent basis to claim 1. Applicants now believe sufficient clarification for the term is provided. No new matter has been added.

Applicants believe that the aforementioned amendments clarify the original intent of claims 1-20 and 33, and that the 35 U.S.C. 112 rejections are hereby overcome.

In Response To The 35 U.S.C. 102 Claim Rejections:

According to the Office Action, claims 1, 15, and 23 are anticipated because Rieth et al. show in figures 1 and 3 a vehicle braking system inherently having a wheel coupled to a vehicle, a brake disclosed in col. 3 lines 21-22 coupled to the wheel, wherein the wheel includes a friction component disclosed in col. 3 line 22 for inhibiting rotation of the wheel, the brake having a first state wherein the friction component is positioned a first distance from the wheel (before pre-charging), and a second state or the pre-charging state disclosed in col. 3 lines 20-24 wherein the friction component is positioned a second distance from the wheel closer than the first distance. The Office Action alleges the vehicle braking system includes a proximity sensor coupled to the vehicle and sensing an object along a direction of travel of the vehicle and generating a proximity signal therefrom, and a controller 17,20 receiving the proximity signal and generating therefrom a threat of collision prediction signal, the controller moving the friction component from the first state to the second state as a function of a high threat of collision determined from the threat of collision prediction signal as suggested in col. 8 lines 28-39.

In response to these rejections, Applicants amend claims 1, 15, and 23 to include the limitations of newly cancelled claims 12, 16, and 30 respectively. The Office Action recognizes that claims 12, 16, and 30 are not anticipated, and therefore only obviousness rejections remain. These obviousness rejections will be addressed in the following section.

Claims 2-14, 16-22, and 24-34 depend from claims 1, 15, and 23 respectively and are believed new for at least the aforementioned reasons.

In Response To The 35 U.S.C. 103(a) Claim Rejections:

Claims 7-9, 22, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rieth et al. in view of US Patent 6411204 to Bloomfield et al. Claims 7-9, 22, and 28 depend from the amended claims 1 and 23 and are therefore believed to be allowable for at least the reasons discussed below regarding claims 12, 16, and 30 (which have been incorporated into claims 1, 15, and 23 respectively).

Claims 10, 16, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rieth et al. in view of US Patent 4969103 to Maekawa. Although claims 16 and 30 are cancelled, claims 15 and 23 are amended to include their respective limitations, and therefore, the rejections thereto will be herein discussed.

According to the Office Action, Rieth et al. describe the invention substantially as set forth above including the limitation of a third state (which, the Office Action alleges, corresponds to the actual application of the brake with the lining touching the rotor) by way of element 20 as suggested in figure 3. The Office Action recognizes that Rieth et al. do not include the limitation of the friction component reaching a third state from a signal indicating that a throttle pedal has been released.

The Office Action alleges Maekawa et al. teach in col. 4, lines 34-37 the use of a brake control system in which a third state of actual brake application is achieved from detection of a signal indicating that a throttle pedal has been released.

In response to these rejections and in addition to amending the claims to include the limitations of claims 16 and 30 as discussed above, Applicants further amend claims 15 and 23 to in accordance with paragraph [0045] of the Detailed Description of the Preferred Embodiment, clarifying that the three distances are from the friction elements (brake pads) to the rotor. No new matter has been added. As the Office Action recognized, both Rieth et al. and Maekawa et al. do not include a third state whereby the friction components are a third distance from the rotor, rather they teach that a third state could be where the friction components contact the rotor, thereby slowing or stopping the vehicle. Applicants, however, include the third state a third distance from the rotor and not in contact thereto. Therefore because each and every element of the claimed invention is not disclosed or suggested in the prior art, claim 10 and amended claims 15 and 23 are believed to be allowable.

Even if all the elements of claim 10 and amended claims 15 and 23 were disclosed or suggested in the proposed combination of references, there is no reason

provided why one of ordinary skill in the art would be motivated to combine the two references.

The Rieth et al. reference is directed to an automatically actuated braking system responsive to road conditions and driver's wishes assumed by the system (Abstract.), as is typical for braking systems. More importantly, however, Rieth et al. do not disclose or teach a controller responsive to throttle release, as recited in claims 10, 15, and 23. Instead, the Rieth et al. system is conventional in that it includes controlling braking as a function of the driver's foot in relation to the brake pedal. (Summary of The Invention, first paragraph.) Rieth et al. do not disclose or suggest the throttle signal is useful for pre-charging brakes.

Rieth et al. do not include a controller moving a friction component close to a wheel as a function of throttle control, and therefore, Rieth et al. merely generates brake charge signals as a function of movement of the driver foot in relation to the brake pedal. Problems inherent in the Rieth et al. design, including device sensitivity limitations, are solved therein by including distance sensors to determine the position of the driver foot. (e.g. column 5, lines 54-64.) This type of sensitivity adjustment is less efficient, due to component costs and costs associated with time required for brake adjustments, than the controller using both the threat of collision signal and the throttle signal of claims 10, 15, and 23.

The Maekawa et al. reference is directed to a conventional speed control apparatus with creep control for suppressing wheel slipping. (Abstract.) Maekawa et al., however, do not disclose or teach the use of a threat of collision prediction or a third pre-braking state (i.e. the friction component a third distance from the rotor) as claimed. Maekawa et al. also does not teach or suggest that application of the Maekawa et al. system would be in any way beneficial to generating a third pre-braking state. Instead, Maekawa et al. teaches away from the combination by suggesting that brakes are applied in response to a release of the throttle for stopping the vehicle. (Column 4, lines 34-37.) It would not, therefore, have been obvious to modify Maekawa et al. as the Office Action proposes.

The Rieth et al. and Maekawa et al. references are directed to conventional speed control systems. More importantly, neither of these references discloses or teaches a third state whereby the friction components are a third distance from the rotor, as recited in claims 10, 15, and 23. Further, no reason has been shown why it would be obvious to selectively combine these references to produce the claimed invention. Applicants therefore submit that no motivation has been shown to combine the references as proposed.

"Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination." *ACS Hospital Systems, Inc. v. Montefiore Hospital*, 732 F.2d 1672, 1577, 221 USPQ 929, 933 (Fed. Cir.1984). Even if all the elements of Applicant's invention are disclosed in various prior art references, the claimed invention taken as a whole cannot be said to be obvious without some reason given in the prior art why one of ordinary skill would have been prompted to combine the teachings of the references to arrive at the claimed invention. Therefore, because no teaching or suggestion is found in any of the references for a controller moving the friction component from the first state or the second state to the third state as a function of the high threat of collision determined from the threat of collision prediction signal and a signal indicating that a throttle pedal has been released, claim 10 and amended claims 15 and 23 are believed to be allowable.

The combination of a high threat of collision and the signal indicating that a throttle pedal has been released described by the Applicants for the controller moving the friction component from the first state or the second state to the third state is advantageous in that it anticipates the braking operation by the driver in reaction to a sensor determined near crash situation and the driver reaction to this situation, i.e. releasing the throttle. This provides an increased amount of safety for the driver and increased vehicle responsiveness for pre-crash situations such that if the throttle remains engaged, the brakes do not move into a near engagement state (third state), otherwise, they provide an increased preparedness for stopping. This increased preparedness for stopping may not be necessary when the driver is still engaging the throttle and attempting to evade the collision. Whereas, the lack of using throttle information of Rieth et al. and the lack of use of the combination of signals of Maekawa et al. require the prior art to include sensitivity adjustments to achieve the accuracy and controllability of the claimed system.

As mentioned above, claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rieth et al. in view of US Patent 6488109 to Igaki et al. Although claim 12 is cancelled, the elements of claim 12 are now included in the amended claim 1 and therefore Applicants respond to the rejection as follows.

The Office Action alleges Rieth et al. teaches the limitations of claim 12 while recognizing it fails to include the limitation of the movement of the friction component being halted through throttle pedal activation.

According to the Office Action, Igaki et al. teach in col. 8 lines 9-13 the use of automatic braking or the automatic movement of a friction component being halted through throttle pedal activation.

As discussed above, the Rieth et al. reference is directed to a typical automatically actuated braking system responsive to road conditions and driver's wishes as

assumed by the system (Abstract.). More importantly, however, Rieth et al. do not disclose or teach that the friction component is responsive to throttle activation as in claim 1. Instead, the Rieth et al. system is conventional in that it includes controlling braking as a function of the driver's foot in relation to the brake pedal and does not discuss halting the braking operation. (e.g. Summary of The Invention, first paragraph.) Rieth et al. do not disclose or suggest the throttle signal is useful for halting pre-charging brakes or halting movement of the friction component closer to the rotor as claimed.

Rieth et al. do not include a controller halting movement of a friction component in relation to a rotor as a function of throttle control, and therefore, Rieth et al. merely generates brake charge signals as a function of movement of the driver foot in relation to the brake pedal and does not address throttle control. Problems inherent in the Rieth et al. design, including overriding of brake charging, are not addressed therein.

The Igaki et al. reference is directed to a conventional stability control apparatus. (Abstract.) Igaki et al., however, do not disclose or teach the use of throttle control for overriding brake pre-charging as claimed. Igaki et al. also does not teach or suggest that application of the Igaki et al. system would be in any way beneficial to halting brake pre-charging operations. Instead, Igaki et al. teaches stopping braking of the vehicle as a function of controlling vehicle stability control. (Column 8, lines 9-13.) It would not, therefore, have been obvious to modify Igaki et al. as the Office Action proposes.

The Rieth et al. and Igaki et al. references are directed to conventional speed control and stability control systems. More importantly, no reason has been shown why it would be obvious to selectively combine these references to produce the claimed invention. Applicants therefore submit that no motivation has been shown to combine the references as proposed.

Regarding the rejections of claims 13, 14, 18, 32, 20, and 34, these claims depend from the amended claims 1, 15, and 23 and are believed to be allowable for at least the reasons listed above.

Claims 1 and 23 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 13 of U.S. Patent No. 6677855 in view of Rieth et al. Applicants have amended claims 1 and 23 as discussed above, and therefore it is believed this rejection is also overcome.

Conclusions:

In view of the aforementioned remarks, it is respectfully submitted that all pending claims are in a condition for allowance. A notice of allowability is therefore

respectfully solicited. Please charge any fees required in the filing of this amendment to Deposit Account 50-0476.

Should the Examiner have any further questions or comments please contact the undersigned. Please charge any fees required in the filing of this amendment to deposit account 06-1510.

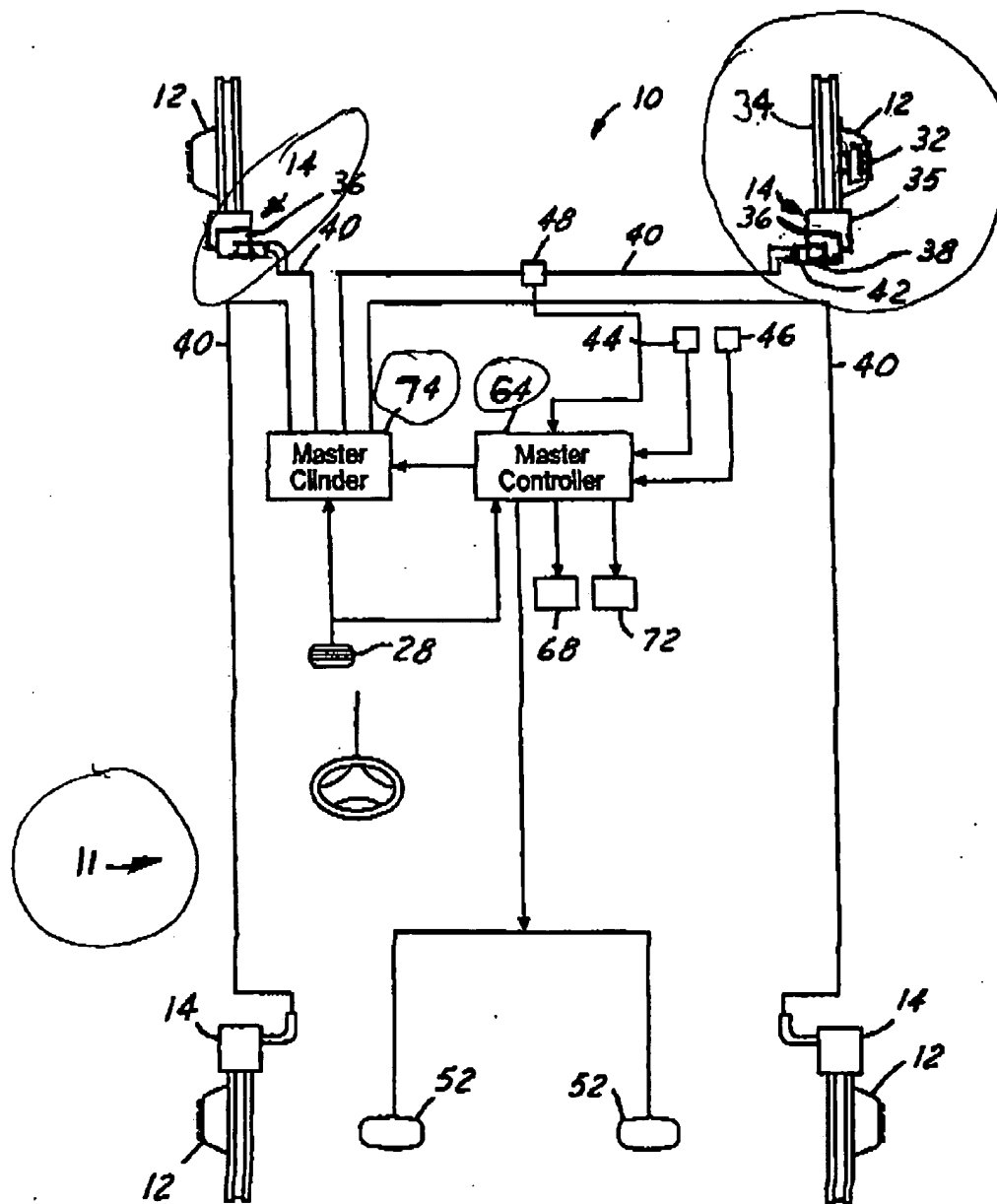
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Dated: March 15, 2005

Annotation Marked-up Drawings Application No. 10/707,501

**FIG. 1**

Annotation Marked-up Drawings Application No. 10/707,501

